Koneru Lakshmaiah Education Foundation

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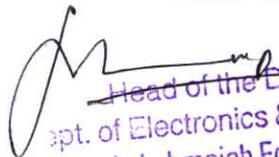
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Department of Electronics & Computer Engineering

Program: M.Tech-Embedded Systems

Academic Year:2019-2020

COURSE CODE	COURSE NAME	CO NO	Description of the Course Outcome
19EM5101	Advanced Embedded Systems	CO1	Must acquire basic knowledge about embedded systems, hardware devices used and the general discussion about at mega Controller.
		CO2	Must be able to use IDE and Free RTOS to develop firmware using embedded C
		CO3	Must be able to develop small applications for reading input from the sensors and writing output to the actuators
		CO4	Understand the purpose and basic functioning of RTOS and be able to implement sample applications through use of RTOS functions
19EM5102	Advanced Micro Processors and Controllers	CO 1	To understand basic concepts and features related to Microprocessors and controllers in relation to ARM7 and LPC2148
		CO 2	Ability to develop firmware using C/C++ and IAR – Integrated Development tool
		CO 3	Ability to develop applications using C/C++ that include GPIO, GSM, Smart Card
		CO 4	Ability to develop applications using C/C++ and RTOS considering, interrupt processing, Application Scheduling and Inter task communication
19EM5103	Embedded Linux and Drivers	CO1	students are capable of using Eclipse as IDE
		CO2	Students understand the basic concepts of LINUX
		CO3	Students be able to configure and cross compile the same for porting on to controllers
		CO4	Able to develop real time applications using Embedded LINUX
		CO5	Understand the toolchain used for configuring, compiling and porting embedded Linux to the target systems
19EM5104	Networking of Embedded Systems	CO1	Should be aware of the concepts related to networking through RS485, I2C, CAN, USB and Ethernet
		CO2	Ability to develop applications that run on RS485 and USB networks
		CO3	Ability to develop applications that run on I2C and CAN networks
		CO4	Ability to develop applications that run on Ethernet
19EM51A1	Digital Image Processing	CO1	Must be aware of basic concepts of digital image processing

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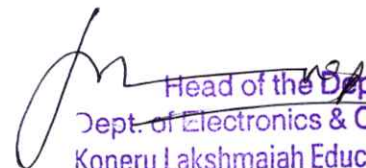
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		CO2	Must be aware of Image transformations, and image enhancements in different domains
		CO3	Must be aware of Image restoration and image segmentation
		CO4	Must be aware of Image Comprehension and Representation
19EM51A2	Natural Language processing	CO1	Understand approaches to syntax and semantics in NLP.
		CO2	Apply the statistical estimation and statistical alignment models
		CO3	Analyse grammar formalism and context-free grammars
		CO4	Apply Rule based Techniques, Statistical Machine translation (SMT), word alignment, phrase-based translation
		C05	Implementing NLP algorithms using python
19EM51A3	Sensors and Actuators	CO1	To make the students understand the operating principles, signal conditioning, and A/D conversion
		CO2	The students must be able to trace the Analog signal flow from the sensors till the time the data is received at the controller side.
		CO3	The students must be able to trace the Analog signal flow from the controller till the time the actual control is exercised
		CO4	The students must be able to trace the Digital signal flow from the digital sensors till the time the data is received at the controller side.
19EM51A4	Artificial Intelligence	CO1	Understand the problem, well-defined problems and their solutions, Uninformed and Informed search.
		CO2	Game playing with adversarial search. Constraint satisfaction problems
		CO3	Building Knowledge and Reasoning: - propositional logic, first-order logic, forward and backward reasoning, resolution.
		CO4	Analysing uncertainty using Bayes theorem, Hidden Markov model and Kalman filters.
19EM51B1	Digital Video Processing	CO1	To make the students understand the basic concepts involved in Video processing
		CO2	To make the students understand the way the Video is displayed through 2D motion
		CO3	To make the students understand the way the Video is displayed through 3D motion
		CO4	To make the students the way the noise existing in a Video can be filtered
		CO5	To make the students understand the concepts involved in Video compressions
19EM51B2	Machine Learning	CO1	Apply Machine Learning Techniques using Decision Trees to solve Real World Problems
		CO2	Build Bayesian models for solving Classification and Prediction problems

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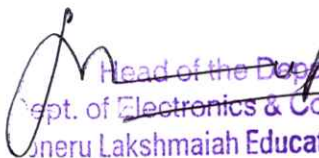
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		CO3	Apply Neural Network and Genetic Algorithm techniques to solve Classification and prediction problems
		CO4	Demonstrates Learning First Order Rules, Analytical Learning and Explanation-Based Learning
19EM51B3	Internet of Things	CO 1	Understand functional blocks and functioning of IOT devices
		CO 2	Understand Communication models and protocols that are used for the development of the IOT based Systems
		CO 3	Understand different networking topologies used for the development of IOT based Networks
		CO 4	Understand various IOT Design Components
19EM51B4	Digital Instrumentation	CO1	Knowledge and understanding of basics of data acquisition, instrument communication, virtual instrumentation and programming the instrumentation
		CO2	Ability to implement data acquisition systems using Microprocessors
		CO3	Ability to develop and implement virtual instruments
		CO4	Ability to implement communication between programmable instruments
19IE5149	Seminar	CO 1	Exhibit communication skills
		CO 2	Exhibit confidence and professional behaviour
		CO 3	Exhibit in-depth technical knowledge
		CO 4	Exhibit ability to conclude
19EM5205	Digital Signal Processing	CO1	students understand the basic concepts related to digital signal processing
		CO2	students understand various issues related to programmable Analog and digital DSP devices
		CO3	students understand various issues related to programmable DSP processors
		CO4	students understand various issues related to Interfacing peripherals to programmable DSP devices
19EM5206	FPGA Design	CO1	Understand the basic concepts of Verilog programming
		CO2	Understand the Combinational & sequential logic circuits and analyse them through test benches using Verilog HDL
		CO3	Understand FPGA based embedded processors architectures
		CO4	Understand signal conditioning and serial communication protocols
		CO5	Analyse the digital modules through project-oriented approach
19EM5207	Wireless networks	CO1	Able to understand Transmission fundamentals and communications networks and application protocol architecture
		CO2	Able to understand and analyse signal encoding techniques, spectrum and different wireless networks
		CO3	Able to understand and analyse various principles of cellular wireless networks

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		CO4	Able to understand wireless protocols and applications of IEEE802.11 architecture and standards
19EM5208	Securing Embedded Systems	CO1	Understand basic foundations of Cryptography
		CO2	Understand in detail different encryption and decryption algorithms
		CO3	Understand different attacking and counter attacking that can be enforced on embedded systems
		CO4	Ability to develop applications that ensure securing the embedded systems
19IE5250	Term Paper	CO1	Ability to do literature survey
		CO2	Ability to review the literature and find the GAP
		CO3	Ability to find and implement new solutions and improving the existing solutions
		CO4	Conduct experimentation to prove the findings
19EM52C1	Digital Audio Processing	CO1	To make the students understand basic concepts involved in Audio processing
		CO2	To make the students understand the way the audio systems are interfaced through serial, parallel and standard bus systems
		CO3	To make the students develop equalisers and make the students understand the same through simulators
		CO4	To make the students develop dynamic control of ranges and make the students understand the same through simulators
		CO5	To make the students understand the concepts involved in Audio compressions
19EM52C2	Deep Learning	CO1	Understand the fundamentals of linear algebra, probability and information theory and numerical computation
		CO2	understand the core aspects of machine learning, deep feedforward networks and regularization for deep learning
		CO3	Analysing the concept of optimization for training deep models, Convolutional networks and finally recursive and recurrent networks
		CO4	Developing a system with a practical methodology of deep networks, some practical applications of deep networks in domains like computer vision, speech recognition, NLP etc...
		CO5	Build &evaluate common practical applications
19EM52C3	Developing IOT Applications	CO 1	Ability describes the Raspberry PI board architecture and components
		CO 2	Ability to design IOT based Applications
		CO 3	Ability to develop IOT applications using Python
		CO 4	Ability setup environment required for developing applications using Python and Raspberry PI board
19EM52C4	Wireless sensor networks	CO1	Able to understand adhoc wireless networks in detail
		CO2	Able to understand wireless sensor networks and the way the data is communicated to other networks

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		CO3	Able to understand various MAC protocols for sensor networks
		CO4	Able to understand and analyse various routing techniques of WSN and ad hoc networks
19EM52D1	Video and Audio Streaming	CO 1	Understand fundamental concepts related to streaming
		CO 2	Understand the process related to video encoding
		CO 3	Understand the process related to Audio encoding
		CO 4	Understand the processes and mechanisms involved in streaming video and audio.
19EM52D2	Cloud Computing and Big Data Analytics	CO1	Under the process involved in sensing and moving data across the network to be stored in the clouds and extract the same for conducting the analytics
		CO2	Understand the fundamentals related to cloud computing especially relating to data storage into cloud and retrieval of the same from the clouds.
		CO3	Ability to develop application for storing the sensed data on to the clouds
		CO4	Ability to conduct Analytics using the data stored in the clouds
19EM52D3	Data analytics for IoT	CO1	Under the process involved in sensing and moving data across the network to be stored in the clouds and extract the same for conducting the analytics
		CO2	Understand the fundamentals related to cloud computing especially relating to data storage into cloud and retrieval of the same from the clouds.
		CO3	Ability to develop application for storing the sensed data on to the clouds
		CO4	Ability to conduct Analytics using the data stored in the clouds
19EM52D4	Sensor network programming	CO1	Able to understand fundamentals of TinyOS and nesC in WSN environment.
		CO2	Able to understand real world programming of wireless sensor network in different scenarios.
		CO3	Able to understand the performance analysis of power-aware algorithms
		CO4	Able to understand and develop energy efficient algorithms for wireless sensor networks thru simulation or real time experiments
19IE6050	Dissertation	CO1	Must be able install and operate a development platform
		CO2	Should be able to draft requirements for a chosen application
		CO3	Should be able to analyze and design the application using formal methods learnt in the curriculum
		CO4	Should be able to develop, test, install and demonstrate the running system

Academic Professor I/C

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